

**Biological Evaluation  
for the Approval of Delaware  
Department of Natural Resources  
and Environmental Control  
Water Quality Standards  
by EPA Region III under Clean  
Water Act Section 303(c)(3)  
February 03, 2015**

## Table of Content

Federal Action.....	1
Regulatory Background on Delaware Water Quality Standards: .....	1
Action Area:.....	1
List of Federally Listed Species Which May be Found Within the Action Area: .....	2
Plants:.....	2
Mammals: .....	4
Birds:.....	5
Fish:.....	5
Reptiles: .....	8
ESA Effects Analysis on Modification of Delaware Administrative Code Title 7401 .....	8
Manner in Which the Action May Affect Listed Species:.....	9
ESA Determination .....	9
References:.....	11
Appendix A - Environmental Protection Agency, Region III State of Delaware Water Quality Standards List of 2014 New and Revised Items Subject to Consultation.....	21
Appendix B - Federally Listed and Proposed Endangered and Threatened Species in Delaware.....	25
Appendix C - Marine Mammal Species under Endangered Species.....	22

## **Federal Action:**

Under Section 303(c) of the CWA and 40 CFR 131, States and authorized tribes have primary responsibility to develop and adopt water quality standards (WQS) to protect their waters. As required by Section 303(c) of the CWA and 40 CFR 131, the U.S. Environmental Protection Agency's (EPA) reviews new and revised surface WQS that have been adopted by States and authorized tribes. State WQS are not considered effective under the CWA until approved by EPA.

The Federal action being evaluated is the approval by the EPA of certain new and revised provisions set forth in the State of Delaware Department of Natural Resources and Environmental Control (DNREC) Administrative Code Title 7401 Surface Water Quality Standards. These regulations, which have been established to protect public health, welfare and enhance water quality in Delaware, were initially proposed by Delaware on December 26, 2013 but subsequently modified at the request of EPA. Only those parts of the regulation relating to aquatic life use support that were added or revised are subject to consultation and were considered as part of this evaluation.

In order to fulfill the goals of the Memorandum of Agreement (MOA), whose intent is to provide efficient mechanisms for improved interagency cooperation under Section 7 of the ESA, EPA will consult with the US Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NOAA Fisheries) on proposed and/or revised State aquatic life criteria. The agencies agree that it is prudent to examine the aquatic life criteria for protection of listed species and critical habitat, and realize the importance of conducting the consultations on proposed and/or revised State criteria in a timely fashion so that any State-adopted aquatic life criteria are protective of that State's listed species and their critical habitat.

## **Regulatory Background on Delaware Water Quality Standards:**

On December 26, 2013, DNREC announced that proposed changes to water quality standards would be published in the Delaware Register of Regulations, Issue Date: January 1, 2014 Volume 17 - Issue 7, 7 Delaware Code, Section 6010 (7 Del.C. §6010) 7 DE Admin. Code 7401 **REGISTER NOTICE.** The proposed amendments were published in the **DELAWARE REGISTER OF REGULATIONS, VOL. 18, ISSUE 4, WEDNESDAY, OCTOBER 1, 2014, pages 312-316 DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL DIVISION OF WATERSHED STEWARDSHIP** Statutory Authority: 7 Delaware Code, Section 6010 (7 Del.C. §6010) 7 DE Admin. Code 7401 **Secretary's Order No. 2014-WS-0019.**

## **Action Area:**

EPA's approval of the Delaware WQS applies to all waters of the United States within the State under Federal jurisdiction. Jurisdiction over non-navigable, isolated, and intrastate waters would likely have to be determined on a case-by-case basis. The area evaluated for action is the surface waters of the State. Waters of the State are defined in 7401 7401 Surface Water Quality

Standards, 2.0 Definition “Waters of the State” means: All surface waters of the State including but not limited to: (1) Waters which are subject to the ebb and flow of the tide, including but not limited to estuaries, bays, and the Atlantic Ocean; (2) All interstate waters, including interstate wetlands; (3) All other waters of the State, such as lakes, rivers, streams (including intermittent and ephemeral streams), drainage ditches, tax ditches, creeks, mudflats, sandflats, wetlands, sloughs, or natural or impounded ponds; (4) All impoundments of waters otherwise defined as waters of the State under this definition; (5) Wetlands adjacent to waters (other than waters that are themselves wetlands) identified above; (6) Waste and stormwater treatment systems, including but not limited to treatment ponds or lagoons designed to meet the requirements of the Clean Water Act (other than cooling ponds which otherwise meet the requirements of subsection (l) of this definition) are not waters of the State; (7) Waters of exceptional recreational or ecological significance (ERES): Waters which are important, unique, or sensitive from a recreational and/or ecological perspective, but which may or may not have excellent water quality. Such waters shall normally have regional significance with respect to recreational use (fishing, swimming and boating), or have significant or widespread riverine, riparian, or wetland natural areas.

### **List of Federally Listed Species Which May be Found Within the Action Area:**

In the attached Appendix A and D are a complete listing of all Federally listed threatened and endangered species in Delaware as compiled by the Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS). These two lists are as current as of January 2014. Specifically, the list includes four species of mammals, seven species of plants, one species of birds, two species of fish, six species of reptiles. Those species that have a limited exposure to water (i.e., terrestrial species) will not be affected by Delaware WQS and, therefore, it is appropriate for EPA to make a ‘no effect’ finding on these species. Listed species that have more than a limited exposure to water are considered either aquatic or aquatic-dependent, and the effect of this approval on these species is subject to consultation. We are considering the following aquatically-dependent species that still occur in Delaware:

Plants-Canby's Dropwort, Swamp Pink, seabeach Amaranth, small-whorled Pogonia, Knieskerns Beackrush, bog Asphodel, Hirsts' Panic grass.

Mammals-Delmarva Fox Squirrel, humpback whale, finback whale, right whale.

Birds-Piping Plover.

Fish-Shortnose Sturgeon, Atlantic Sturgeon.

Reptiles- Bog Turtle, Loggerhead Turtle, Atlantic Ridley Turtle, Leatherback Turtle, Green Turtle, Hawksbill Turtle.

### ***Plants:***

The **Hirsts' Panic grass, (*Dichanthelium hirstii*)** is listed as a candidate species in 1998 and is found at one location in Sussex County (NatureServe. 2014). All known sites of

*Dichantherium hirstii* are wetlands within a matrix of pine/oak forest, and the habitats are variously described as intermittent/seasonal ponds, meadows, or savannas (U.S. Fish and Wildlife Service, 2013). The one site in Delaware is Assawoman Pond, a Coastal Plain seasonal pond, which is a nontidal, freshwater depression wetland. The major threats to *Dichantherium hirstii* are encroachment of woody and herbaceous vegetation, competition from rhizomatous perennials, fluctuations in hydrology, grazing by resident Canada geese and threats associated with small population number and size.

The **Knieskern's Beaked-rush, (*Rhynchospora knieskernii*)** is listed as threatened in Delaware although there are no recent records of its presence and with the last recorded sighting being from 1875 (U.S. Fish and Wildlife Service, 1993). It is found at the edge of ponds, wet depressions, or shallow sinkholes within small (generally less than one acre) wetland complexes. These wetlands are generally characterized by seasonally variable water levels. *R. knieskernii* is an obligate hydrophyte that occurs in groundwater-influenced, constantly fluctuating, successional habitats. Populations are subject to threats ranging from habitat degradation or loss caused by development and land use practices to natural threats such as succession (invasion of woody plants). Its aquatic dependence is wetland habitat.

The **swamp pink (*Helonias bullata*)** is listed as threatened and found throughout Delaware (U.S. Fish and Wildlife Service, 1991). The swamp pink is a distinctive perennial plant with thick stocky rhizomes. It inhabits a variety of freshwater wetlands, including spring seepages, swamps, bogs, wet meadows and margins of small streams. Although known to inhabit a variety of wetlands, swamp pink is only found in patchy distribution because of its restrictive habitat requirements. The major threat to the species is loss and degradation of its wetland habitat due to encroaching development, sedimentation, pollution, succession, and wetland drainage. Activities that increase sedimentation, pollutant runoff, or cause flooding of habitat should, therefore, be avoided. Habitat loss, fragmentation, and degradation, collection, trampling and other biological and physical factors threaten swamp pink. Human foot traffic or vehicle traffic, as well as beaver dam building constitute other threats to the swamp pink. Site conservation is the primary recovery plan for the swamp pink.

**Canby's dropwort (*Oxypolis canbyi*)** is listed as endangered in Delaware although there are no recent records of its presence. The last recorded sighting was from 1875 (U.S. Fish and Wildlife Service, 1986). The Canby's dropwort is native to the coastal plain. It is a perennial herb that occurs in pond cypress savannas, the shallows and edges of cypress pond pine ponds, sloughs, and wet pine savannas. The largest and most vigorous populations have been found to occur in open bays or ponds which are wet throughout most of the year, but which have little or no canopy. Soil types associated with Canby's dropwort habitat are usually characterized by medium to high organic content and high water table which are also deep, poorly drained, and acidic. The most serious threat to Canby's dropwort is the loss or degradation of the wetland habitats in which it occurs. Highway construction and predation by various insects are also threats to this species survival. Its aquatic dependence is wetland habitat.

The **seabeach Amaranth (*Amaranthus pumilus*)** is listed as threatened and is found at Atlantic coastal beaches in Sussex County (U.S. Fish and Wildlife Service, 1996). The species is native to the barrier island beaches of the Atlantic Coast. An annual plant, this species appears

to need extensive areas of barrier island beaches and inlets, functioning in a relatively natural and dynamic manner, allowing it to move around in the landscape, occupying suitable habitat as it becomes available. It often grows in the same areas selected for nesting by shorebirds, such as plovers, terns, and skimmers. Threats include beach stabilization efforts (particularly the use of beach armoring, such as sea walls and riprap), intensive recreational use, and herbivory by webworms.

The **bog Asphodel (*Narthecium americanum*)** is a candidate species although it is presumed extirpated in Delaware (U.S. Fish and Wildlife Service. 1996). The last recorded sighting being from 1895. A more recent survey conducted in 2011 did not find any specimens. *Narthecium americanum* is found along streams and rivers in savanna areas and within Atlantic white cedar (*Chamaecyparis thyoides*) forests in the Pinelands National Reserve of New Jersey. Threats include habitat destruction from wetland filling, draining, and flooding as part of cranberry operations, upland development, overall range contraction, off road vehicle (ORV) use and ground water decline.

The **small-whorled Pogonia, (*Isotria medeoloides*)** is listed as threatenend and is found in New Castle County at one site. (U.S. Fish and Wildlife Service 1992). The small whorled pogonia occurs on upland sites in mixed-deciduous or mixed deciduous/coniferous forests that are generally in second or third-growth successional stages. Characteristics common to most *I. medeoloides* sites include sparse to moderate ground cover in the species' microhabitat, a relatively open understory canopy, and proximity to features that create long persisting breaks in the forest canopy. Soils at most sites are highly acidic and nutrient poor, with moderately high soil moisture values. Residential or commercial development, both directly and indirectly, is a primary factor in the destruction of small whorled Pogonia habitat. Other threats such as recreational use of the habitat and herbivory have also been identified as harming small whorled Pogonia populations (U.S. Fish and Wildlife Service. 1988).

## ***Mammals:***

The **Delmarva fox squirrel (*Sciurus niger cinereus*)** is listed as endangered and occurs in Sussex County (U.S. Fish and Wildlife Service, 1993). The fox squirrel is found in pine and oak forests, both bottom land and upland, with a relatively open under story. Therefore, destruction of forest habitat due to development is a threat to the fox squirrel. The fox squirrel relies on the forest to provide food (nuts, seeds, and fruit) and shelter in tree hollows. Food abundance, disease, predation, and destruction of forest habitat due to development affect squirrel numbers from year to year. Implementing appropriate forest management practices to maintain suitable habitat for the squirrel is essential to its recovery. Aquatic dependence is bottom land forest habitat.

**Various marine mammals** such as the right whale (***Balaena glacialis***), humpback whale (***Megaptera novaeangliae***) and finback whale (***Balaenoptera physalus***) occur in ocean waters off the coast of Delaware (NOAA National Marine Fisheries Service 1991a, 1991b, 1998b, 1998c). There is some evidence that healthy whales occasionally use bay waters. While whales are indeed occasionally seen in the Delaware Bay, it is not considered critical habitat for

them. Recovery plans include maintaining and enhancing whale habitats, and identifying and reducing death, injury or disturbance to whales caused by humans.

### ***Birds:***

The **pipin plover** (***Charadrius melodus***) is listed as threatened (U.S. Fish and Wildlife Service. 1988) and are found in Sussex County. They breed on sandy, gravel and/or cobbled coastal beaches in areas with little or no vegetation. Wintering plovers are generally found near coastal inlets. Piping plovers nest on coastal beaches above the high tide line, sand flats at the ends of sand spits and barrier islands, and around dunes. They may also nest on areas where suitable dredge spoil has been deposited. Piping plovers forage in intertidal zones and wrack lines of ocean beaches, wash over areas, mudflats, sand flats, coastal ponds, lagoons and salt marshes, eating marine worms, fly larvae, beetles, crustaceans, mollusks and other invertebrates. Its numbers were drastically reduced in the 20th century because of uncontrolled commercial and recreational hunting and egg collecting in the 1900s, and dune stabilization and beachfront development after World War II. Aquatic dependence is oceanic and estuarine habitats. Today the populations are limited by predators (including dogs and cats); flooding of the nest by rain or tidal over wash, development and beach stabilization, and pedestrian and off road vehicle traffic that inadvertently crush eggs or chicks. The habitat loss and degradation, disturbance by humans and domestic animals, and increased predation are important causes of the current downtrend.

### ***Fish:***

The **shortnose sturgeon** (***Acipenser brevirostrum***) is a federally listed species found in the Delaware Bay. Shortnose sturgeon was listed as endangered on March 11, 1967 (32 FR 4001), and they remained on the endangered species list with the enactment of the Endangered Species Act (ESA) in 1973 (NOAA National Marine Fisheries Service 1998a, 2002). With Delaware waters also draining into the Chesapeake Bay, the reader is directed to the most recent Maryland Biological Evaluation for discussion on shortnose Sturgeon in the Chesapeake Bay (EPA 2014). The National Oceanic and Atmospheric Administration's National Marine Fisheries Service Shortnose Sturgeon Recovery Plan (Recovery Plan) indicates reports of its occurrence in the Delaware Bay in 1800's (NOAA National Marine Fisheries Service 1998a). Shortnose sturgeon appears to spend most of their life in their natal river systems, only occasionally entering higher salinity environments. They are benthic omnivores and continuously feed on benthic and epibenthic invertebrates including mollusks, crustaceans and oligochaete worms (Dadswell 1979). Shortnose sturgeon depends on free-flowing rivers and seasonal floods to provide suitable spawning habitat. For shortnose sturgeon, spawning grounds have been found to consist mainly of gravel or rubble substrate in regions of fast flow. Flowing water provides oxygen, allows for the dispersal of eggs, and assists in excluding predators. Seasonal floods scour substrates free of sand and silt, which might suffocate eggs (Beamesderfer and Far 1997). Shortnose sturgeon spawns in upper, freshwater sections of rivers and feed and overwinters in both fresh and saline habitats. In populations that have free access to the total length of a river (absent of dams), spawning areas are located at the farthest accessible upstream reach of the river, often just below the fall line (NOAA National Marine Fisheries Service 1998a).

With regard to the Delaware River, recent studies indicate that spawning areas are considered to be from Scudder Falls to above Fife & Drum rapids (ERC, Inc. 2008). Foraging occurs in summer and fall from Trenton, NJ down to Artificial Island. Overwintering has been noted in Roebing to Trenton reach as well as in reach below Wilmington Delaware. Tracking studies indicate the entire lower Delaware River may be used as overwintering area by juvenile shortnose sturgeons.

According to the Recovery Plan shortnose sturgeon are affected by habitat degradation or loss (resulting, for example, from dams, bridge construction, channel dredging, and pollutant discharges) and mortality (resulting, for example, from impingement on cooling water intake screens, dredging and incidental capture in other fisheries) as principal threats to the species' survival (NOAA National Marine Fisheries Service 1998a). The recovery goal is identified as delisting shortnose sturgeon populations throughout their range, and the recovery objective is to ensure that a minimum population size is provided such that genetic diversity is maintained and extinction is avoided.

The **Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)** is a federally listed species and can be found in Delaware Bay and Delaware River. Atlantic sturgeon was listed as endangered on February 6, 2012 (77 FR 5880) and, for the purpose of this action, specifically the New York Bight (includes Delaware Bay) Distinct Population Segment (DPS). With Delaware waters also draining into the Chesapeake Bay, the reader is directed to the most recent Maryland Biological Evaluation for discussion on Atlantic Sturgeon DPS in the Chesapeake Bay. (EPA 2014) With this being a recent listing, a recovery plan has yet to be developed for New York Bight DPS. The Atlantic States Marine Fisheries Commission (ASMFC) initiated a stock assessment for Atlantic sturgeon. The assessment is expected to be completed in late 2014/early 2015. Although no Recovery Plan has been drawn up, there is a wealth of information regarding the Atlantic sturgeon. The Atlantic sturgeon has been known to be stressed for quite some time with its first identification as candidate species for listing under the ESA in 1991. After a 1997 petition from the Biodiversity Legal Foundation, the Service revisited the subject and decided that enough information was available to warrant an action (62 FR 54018). In 1998, the Service determined that listing was not warranted at that time (63 FR 50187). In the same year the Atlantic States Marine Fisheries Commission (ASMFC) imposed a 20 – 40 year moratorium on all Atlantic sturgeon. Following that action, in 1999, the Service closed the Exclusive Economic Zone (EEZ) to Atlantic sturgeon retention. In 2003, the Services convened a workshop to discuss the status of this species and obstacles that were impeding their recovery. One outcome of that workshop was a second review of Atlantic sturgeon status by the Atlantic Sturgeon status review team (ASSRT). The ASSRT published a report in 2007. In 2009, the National Resources Defense Council (NRDC) petitioned the Service to list the species as endangered under ESA. As a result of the information provided by the AART report, the NRDC petition, and other new information, the Service determined that the Atlantic sturgeon qualifies as species under ESA and, for the purpose of this action, specifically the Delaware Bay section of the New York Bight DPS.

Atlantic sturgeon is an anadromous fish which spend most of its life in brackish or salt water and migrates to freshwater to spawn. Spawning adults migrate in the April-May time frame from the mid-Atlantic to flowing waters between the salt front and fall line of large rivers. These



spawning adults remain in river until fall, at which time they migrate back to the Atlantic Ocean. The hatched youth remain in their natal waters up to five or six years before migrating to the ocean. Because of this behavior pattern, the entire Delaware Bay and Estuary is considered the area of concern. Once they reach open water, Atlantic sturgeon resides close to shore. They are long living fish which may live up to 60 years.

Historically, Atlantic sturgeon were once very plentiful in the Delaware Bay with an estimated 20,000 female adults present before sturgeon fishery began in 1890s (Secor 2002). Historical harvests were reported in the Delaware Bay. This harvesting for both caviar and meat grew exponentially in the late 1800 with record landing in 1890 where over 3350 metric tons (mt) of Atlantic sturgeon were landed from coastal rivers along the Atlantic Coast. By the late 1800's, the Delaware River Atlantic sturgeon fishery was the largest in the United States and produced 75% of the US sturgeon harvest from 1890-1899 (Townsend 1900). Delaware River landings reached a peak in 1888 with a total catch of nearly 3000 mt of Atlantic sturgeon (Smith 1894). By 1901, the fishery collapsed when less than 10% (295 mt) of its 1890 peak landings were reported. The fisheries never recovered with harvest remaining at 1-5% of the historic peak. The Atlantic sturgeon fishery was closed by ASMFC in 1998, when a coast wide fishing moratorium was imposed for 20-40 years, or at least until 20 year classes of mature female Atlantic sturgeon were present (ASMFC 1998A).

There are many factors which play a role in affecting the ability of the Atlantic sturgeon to recover in the twentieth century and beyond. With this fishery closed, direct harvest is no longer a factor. However, by catch does exert a pressure on the population. Since Atlantic sturgeons spend a portion of their lives in rivers, estuaries, the near shore ocean, and the EEZ, they are subject to incidental capture at greater rates than nonanadromous species. Interestingly enough, by catch also allows for scientific studies to be done on populations and dispersal and growth of yearling Atlantic Sturgeon in Chesapeake Bay (Secor, et al, 2000). As part of this study, both Maryland and Virginia initiated an award program for Chesapeake Bay fishermen for the capture and holding of live juvenile Atlantic sturgeon.

Among the many variables affecting habitat or range are dams and turbines, dredging and blasting, and water quality. There are no dams in Delaware River which are below historic spawning reaches. Dredging activities which occurs in tidal Delaware Rivers could destroy habitat suitable for spawning and smother eggs with spoils. Delaware Bay sturgeon need clean, hard substrate for attachment of demersal, adhesive eggs (Bushnoe et al. 2005). Rubble, cobble, and gravel size rock, as well as shell, forest litter, and submerged vegetation provide substrate for egg attachment, all which can be destroyed or smothered during dredging operations. It is also possible for Atlantic sturgeon to be killed during the actual dredging activity.

Water quality, especially low dissolved oxygen levels, would appear to be a potential limiting factor. Dissolved oxygen in the hypoxia range of 2-3 mg/L along with higher temperature could result in low survival rate (Secor, 1998), (Niklitschek, E., Secor, D.H., 2009). Atlantic sturgeon will come to the surface to take in oxygen rich water thus mitigating hypoxic bottom water conditions. However, eggs and juveniles will not be able to escape the effect of hypoxia conditions in sturgeon nursery areas. Current knowledge about Atlantic sturgeon is that the documented spawning area is in the Marcus Hook through Wilmington area of the tidal

Delaware River, an area which is not currently known to have hypoxic conditions. Other studies have spawning occurring between mid-late June in freshwater-tidal reaches between north Philadelphia, PA (rkm 176) and Trenton, NJ (rkm 211). These spawning areas are located much further upriver than historically reported spawning grounds (rkm 75 – 130; Ryder 1890, Cobb 1899) which may, in part, be due to increased saltwater intrusion.

### **Reptiles:**

The **bog turtle (*Clemmys muhlenbergii*)** is listed as threatened and is currently found in New Castle County (U.S. Fish and Wildlife Service. 2001). This species has a fairly wide distribution on the eastern coast of the United States (Buhlmann, et.al., 1997). Bog turtles live in relatively open portions of sphagnum bogs, swamps or marshy meadows with slow moving, spring fed streams or spring runs with soft bottoms. Although more often associated with land habitats, research has shown that 72% of the known bog turtle sites are located in riverine drainage areas (Buhlmann, et.al., 1997). The primary threat to bog turtles is the draining or destruction of its habitat. Many have also been removed for commercial purposes. The bog turtle's aquatic dependence is mainly wetland and stream habitat.

Marine **sea turtles** include the threatened loggerhead turtle (***Caretta caretta***), endangered Atlantic ridley turtle (***Lepidochelys kempi***), endangered leatherback turtle (***Dermochelys coriacea***), endangered hawksbill turtle (***Eretmochelys imbricata***), and threatened green sea turtle (***Chelonia mydas***). Sea turtles are migratory; Oceanic summer visitor to coastal waters. They enter the Delaware Bay in late April to early May when water temperatures rise and depart late September to late November. They are also spotted along the Delaware Atlantic coast about the same time (Mark Barath, personal communication, 2014). The estimated density of sea turtles in Delaware Bay is 21-33/100km<sup>2</sup>. The lower Delaware Bay serves as an important foraging area. Sea turtles in the Delaware Bay (mostly loggerheads and Atlantic ridley) forage on crustaceans (e.g., crabs) and mollusks. Threats to the turtles include, incidental takes, poaching, pollution and marine habitat degradation. Recovery plans include protection of nesting habitats, eliminating mortality from incidental catch in commercial fishing, and reduction of marine pollution (NOAA National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a, 1991b, 1992, 1993; U.S. Fish and Wildlife Service and NOAA National Marine Fisheries Service 1992).

## **ESA Effects Analysis on Modification of Delaware's Administrative Code Title 7401**

This section summarizes the new or revised Delaware WQS which may affect listed species in Delaware waters and presents an analysis to determine the possible impacts to those species. In several sections Delaware made many very minor modifications for clarification purposes. These minor modifications will not be considered here, nor will new or revised WQS which have no effect on listed species, or for which EPA lacks discretion in approving.

## **Description of Delaware's Water Quality Standards:**

Delaware's water quality standards are set forth in State of Delaware Department of Natural Resources and Environmental Control (DNREC) Administrative Code Title 7401 Surface Water Quality Standards. These standards are adopted and implemented to protect the waters of the state regulations. This would provide protection for the aquatic and aquatically dependent listed species. The standards are based on federal criteria, regulation, and guidance.

On April 1, 2014, the State of Delaware Department of Natural Resources and Environmental Control (DNREC) published proposed new and revised WQS in the DELAWARE REGISTER OF REGULATIONS, VOL. 17, ISSUE 10, TUESDAY, Surface Water Quality Standards. Among the proposed amendments were the following: (1) Under Section 4.5.9.3.1.2 Table 1: Water Quality Criteria for Protection of Aquatic Life - Acrolien, Carbaryl, Diazinon and Tributyltin, (2) Under Sections, 2, 3, and 4.5.2.5: New wetland-dominated tidal river designated use and site specific Dissolved Oxygen criteria for tidal Murderkill River.

## **Manner in Which the Action May Affect Listed Species:**

The following are the sections in Delaware's water quality standards, a brief description of the content of the section, and a description of the revision.

7401 Surface Water Quality Standards Sections, 2, 3, and 4.5.2.5 thru 4.5.2.5.1.2: New tidal Murderkill River site specific Standards and conditions for Dissolved Oxygen criteria.

7401 Surface Water Quality Standards 4.5.9.3.1.2 Table 1: Water Quality Criteria for Protection of Aquatic Life - Acrolien, Carbaryl, Copper, Diazinon and Tributyltin.

Details of the revisions on which EPA would be taking action can be found in Appendix A to this document. EPA is making the finding that our approval of these sections may affect, but will not adversely affect listed species and their critical habitat. EPA views these revisions as beneficial to the conservation and protection of aquatic life and their habitats from these pollutants in the surface waters of Delaware including the endangered and/or threatened species living in the aquatic environment.

All of the additions and revisions to aquatic life criteria that Delaware has adopted (Acrolien, Carbaryl, Copper, Diazinon and Tributyltin) are identical to the existing EPA 304(a) recommendations. With the Bog turtle habitat consisting primarily of wetlands in headwaters of small streams it is unlikely that any NPDES discharges or other sources of Acrolien, Carbaryl, Copper, Diazinon and Tributyltin will be present in bog turtle habitats. The tidal Murderkill River wetland-dominated designated use and site specific criteria for Dissolved Oxygen (DO) are based on methodologies found in Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras (EPA 2000). Delaware conducted a Use Attainability Analysis (UAA) as support for the tidal Murderkill River wetland-dominated designated use and the site specific criteria. This UAA provided support for new DO criteria. In the discussions, presentations, and documents provided in support of this process, it was noted

that the tidal Murderkill River had similar environmental conditions to a neighboring less developed St. Jones watershed: both biota and physical/chemical conditions showed similar patterns. Of interest to this BE, neither Atlantic nor shortnose Sturgeons were ever observed during the several decades of fisheries studies in both the tidal Murderkill and adjacent St. Jones Rivers. A review of the literature on both shortnose and Atlantic Sturgeon does not appear to indicate that these species would venture into a small Delaware Bay tidal river such as the Murderkill River.

EPA is making the finding that our approval of these new WQS may affect, but will not adversely affect listed species and their critical habitat. EPA views these revisions as beneficial to the conservation and protection of aquatic life and their habitats from these pollutants in the surface waters of Delaware including the endangered and/or threatened species living in the aquatic environment. These regulations provide better aquatic life protection from pollutants based on the latest scientific data, which will provide better protection for any candidate, threatened or endangered species present. EPA recognizes that it may need to revise its decision if this consultation identifies situations where the approved criteria may not be adequate. If this should be the case, EPA will coordinate with the Services to determine a reasonable approach.

### ***ESA Determination***

EPA finds that EPA's approval of Delaware's new or revised regulations for aquatic life water quality criteria, and for the use refinement of the tidal Murderkill may have an effect but are not likely to adversely affect listed species in Delaware.

## References:

- Barath, M. 2014. Personal communication, United States Environmental Protection Agency, Philadelphia, Pennsylvania.
- Beamesderfer, R. and R. Farr. 1997. Alternatives for the protection and restoration of sturgeons and their habitat. *Environmental Biology of Fishes* 48: 407-417.
- Buhlmann, K., et.al. 1997. New Approaches for the Conservation of Bog Turtles, *Clemmys muhlenbergii*, in Virginia.
- Dadswell, M. 1979. Biology and population characteristics of the shortnose sturgeon, *Acipenser brevirostrum*, LeSueur 1818 (Osteichthyes: Acipenseridae) in the Saint John River estuary, New Brunswick, Canada. *Canadian Journal of Zoology*. 57:2186-2210.
- Dadswell, M., et.al. 1984. Synopsis of biological data on shortnose sturgeon, *Acipenser brevirostrum*, LeSueur 1818. National Oceanic and Atmospheric Administration, Washington, D.C., 45pp.
- ERC, Inc. (Environmental Research and Consulting, Inc.). 2008. Final report of investigations of shortnose sturgeon early life stages in the Delaware River, spring 2007 and 2008. Prepared for the NJ Division of Fish and Wildlife. 24 pp.
- Excerpts from Biological Opinion on Sea Turtles. National Marine Fisheries Services, Oxford, Maryland.
- Mangold, M. 2003. Atlantic Sturgeon Reward Program Catch Data (unpublished), 1994-2003. U.S. Fish and Wildlife Service, Maryland Fisheries Resource Office, Annapolis Maryland.
- NatureServe. 2014. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://explorer.natureserve.org>. (Accessed: May 28, 2014 ).
- Niklitschek, E., Secor, D.H., 2009. Dissolved oxygen, temperature and salinity effects on the ecophysiology and survival of juvenile Atlantic sturgeon in estuarine waters: II. Model development and testing. *J. Exp. Mar. Biol. Ecol.* 381, S161–S172.
- NOAA National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991a. Recovery plan for U.S. population of Atlantic green turtle (*Chelonia mydas*). National Marine Fisheries Service, Washington D.C.
- NOAA National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991b. Recovery plan for U.S. population of loggerhead turtle (*Caretta caretta*). National Marine Fisheries Service, Washington D.C.

NOAA National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery plan for leatherback turtles (*Dermochelys coriacea*) in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington D.C.

NOAA National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1993. Recovery plan for hawksbill turtles in the U.S. Caribbean Sea, Atlantic Ocean, and Gulf of Mexico. National Marine Fisheries Service, St. Petersburg, Florida.

NOAA National Marine Fisheries Service. 1991a. Recovery Plan for the northern right whale (*Eubalaena glacialis*). Prepared by the Right Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 86 pp.

NOAA National Marine Fisheries Service. 1991b. Recovery Plan for the humpback whale (*Megaptera novaeangliae*). Prepared by the Humpback Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland. 105 pp.

NOAA National Marine Fisheries Service. 1998a. Recovery plan for the shortnose sturgeon (*Acipenser brevirostrum*). Prepared by the Shortnose Sturgeon Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland.

NOAA National Marine Fisheries Service. 1998d. Status review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). NMFS, Gloucester, MA. 124 pp.

NOAA National Marine Fisheries Service. 2000. A protocol for use of shortnose and Atlantic sturgeons. NOAA Technical Memorandum. NMFS-OPR-18. Silver Spring, Maryland. 21 pp.

O'Herron, J.C., K.W. Able, and R.W. Hastings. 1993. Movements of shortnose sturgeon (*Acipenser brevirostrum*) in the Delaware River. *Estuaries* 16:235-240.

Shortnose Sturgeon Status Review Team. 2010. A Biological Assessment of shortnose sturgeon (*Acipenser brevirostrum*). Report to National Marine Fisheries Service, Northeast Regional Office. November 1, 2010. 417 pp.

Simpson, P. C., Fox, D. A. 2007. Atlantic sturgeon in the Delaware River: Contemporary population status and identification of spawning areas. Completion Report: Award NA05NMF4051093, 40 pp.

Smith, H.M. 1894. A statistical report on the fisheries of the Middle Atlantic States. *Bulletin of the U.S. Fish Commission* 14:339-467.

Townsend, C.H. 1900. Statistics of the fisheries of the Middle Atlantic States. Part 26 of the Commissioner's Report to the U.S. Commission of Fish and Fisheries: 195-310.

U.S. EPA. 2000. Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras. Office of Water. Washington, DC. EPA-822-R-00-012

U.S. EPA. 2014. Biological Evaluation for the Approval of Maryland Department of the Environment Water Quality Standards by EPA Region III under Clean Water Act Section 303(c)(3). Philadelphia, PA. 45 pp.

U.S. Fish and Wildlife Service and NOAA National Marine Fisheries Service. 1992. Recovery plan for the Kemp's Ridley sea turtle (*Lepidochelys kempii*). National Marine Fisheries Service, St. Petersburg, Florida.

U.S. Fish and Wildlife Service, 1988. Atlantic Coast Piping Plover Recovery Plan. U.S. Fish and Wildlife Service, Newton Corner, MA. 77 pp.

U.S. Fish and Wildlife Service, 1988. Five-Year Review, Small Wholed Pogonia (*Isotria medeoloides*), U.S. Fish and Wildlife Service, Newton Center, MA. 29 pp.

U.S. Fish and Wildlife Service, 1991. Swamp Pink Recovery Plan. U.S. Fish and Wildlife Service, Newton Corner, MA. 39 pp.

U.S. Fish and Wildlife Service, 1993. Recovery Plan for the Delmarva Fox Squirrel. U.S. Fish and Wildlife Service, Hadley, MA. 65 pp.

U.S. Fish and Wildlife Service, Agency Draft Recovery Plan for Canby's Dropwort. U.S. Fish and Wildlife Service, Atlanta Georgia. 32 pp.

U.S. Fish and Wildlife Service, and U.S. Department of Commerce, NOAA, 1992. Recovery Plan for the Kemp's Ridley Sea Turtle. U.S. Fish and Wildlife Service and National Marine Fisheries Service, Washington, D.C. 40 pp.

U.S. Fish and Wildlife Service. 1988. Atlantic coast piping plover recovery plan. U.S. Fish and Wildlife Service, Newton Corner, Massachusetts. 77 pp.

U.S. Fish and Wildlife Service. 1992. Small Whorled Pogonia (*Isotria medeoloides*) Recovery Plan, First Revision. Newton Corner, Massachusetts. 75 pp.

U.S. Fish and Wildlife Service. 1993. Knieskern's Beaked-Rush (*Rhynchospora knieskerni*,) Recovery Plan. Hadley, Massachusetts. 40 pp.

U.S. Fish and Wildlife Service. 1996. Recovery Plan for Seabeach Amaranth (*Amaranthus pumilus*). Atlanta, Georgia. 63 pp.

U.S. Fish and Wildlife Service. 2001. Bog Turtle (*Clemmys muhlenbergii*), Northern Recovery Plan. Hadley, Massachusetts. 103 pp.

U.S. Fish and Wildlife Service. 2007. Endangered and threatened wildlife and plants; 90-day finding on a petition to list Kenk's amphipod, Virginia well amphipod, and the copepod *Acanthocylops colubiensis* as endangered. Federal Register 72(175):51766-51770.

U.S. Fish and Wildlife Service. 2010. Endangered and Threatened Wildlife and Plants; Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions; Proposed Rule. Federal Register 75(217):69221-69294.

U.S. Fish and Wildlife Service. 2011. Kenk's Amphipod (*Stygobromus kenki*) Spotlight Species Action Plan. Hadley, Massachusetts. 4 pp.

U.S. Fish and Wildlife Service. 2012. U.S. Fish and Wildlife Service Species Assessment and listing Priority Assignment Form. Hadley, Massachusetts. 29 pp.

U.S. Fish and Wildlife Service. 2013. U.S. Fish and Wildlife Service Species Assessment and listing Priority Assignment Form. Hirst Brothers' Panic grass. Hadley, Massachusetts. 103 pp.



### **Appendices:**

A. Environmental Protection Agency, Region III State of Delaware Water Quality Standards List of 2014 New and Revised Items Subject to Consultation

B. Federally Listed and Proposed Endangered and Threatened Species in Maryland,  
[http://ecos.fws.gov/tess\\_public/pub/stateListing.jsp?state=MD&status=listed](http://ecos.fws.gov/tess_public/pub/stateListing.jsp?state=MD&status=listed)

C. Marine Mammal Species under Endangered Species Act  
<http://www.nmfs.noaa.gov/pr/species/esa/mammals.html>

Appendix A - Environmental Protection Agency, Region III State  
of Delaware Water Quality Standards List of 2014 New and  
Revised Items Subject to Consultation

**Appendix A – Environmental Protection Agency, Region III State of Delaware Water Quality Standards List of 2014 New and Revised Items Subject to Consultation.**

Section Approved	Description of Revision	EPA Rationale
7 DE Admin. Code 7401: 2.0 Definition, “Wetland Dominated Tidal River Designated Use”	Added definition: “Applies to the Murderkill River from the Route 1 Bridge to the confluence with Delaware Bay which supports the survival, growth and propagation of balanced indigenous populations of fish inhabiting the river and adapted to intermittent low dissolved oxygen caused by natural processes during the period May 16 through September 30.”	Definitions in of themselves are not water quality standards subject to EPA’s CWA Section 303(c) action. EPA reviews definitions in the context in which they are used in newly revised or adopted water quality standards. Approval of the wetland dominated tidal river designated use as described below includes approval of this term as applied in the approved WQS.
7 DE Admin. Code 7401: 3.0 Stream Basins & Designated Uses, 19. Murderkill River Fish, Aquatic Life and Wildlife Footnote (r)	Designates the Murderkill River from the Route 1 Bridge to the confluence with Delaware Bay a new subcategory of aquatic life use described as wetland dominated tidal river designated use, during the period specified in the definition of the use.	Delaware submitted a use attainability analysis (UAA) supporting the designation of this subcategory of aquatic life protection. In accordance with the requirements of 40 CFR 131.10, the UAA showed that dissolved oxygen is naturally limited in the specified segment of the river, based on the natural effect of the marshes in the dissolved oxygen concentrations. The UAA also shows that the new aquatic life subcategory is the highest attainable use during the specified season, in light of the natural conditions.

Section Approved	Description of Revision	EPA Rationale
7 DE Admin. Code 7401: 4.0 Criteria To Protect Designated Uses. 4.5.2.5, 4.5.2.5.1, including 4.5.2.5.1.1 – 4.5.2.5.1.2	<p>This new subsection replaces prior text and specifies seasonal dissolved oxygen criteria for the Murderkill River from the Route 1 Bridge to the Confluence with the Delaware Bay:</p> <p>For the period from May 16 through September 30, daily average shall not be less than 3.0 mg/l and the one-hour average shall not be less than 1.0 mg/l.</p>	<p>The new seasonal DO criteria apply to the new segment-specific Murderkill River designated use and is consistent with EPA’s recommendation published in Ambient Aquatic Life Water Quality Criteria for Dissolved Oxygen (Saltwater): Cape Cod to Cape Hatteras (EPA-822-R-00-012, November 2000) which is incorporated by reference published in the <i>National Recommended Water Quality Criteria: 2013</i> (EPA Web Publication) as amended. Delaware conducted a use attainability analysis showing that these criteria are protective of this use subcategory.</p>
7 DE Admin. Code 7401: 4.0 Criteria To Protect Designated Uses. 4.5.9.3.1 Aquatic Life Criteria: TABLE 1 WATER QUALITY CRITERIA FOR PROTECTION OF AQUATIC LIFE	<p>Acrolein: CAS#107028 added acute freshwater criterion(ug/L) 3.0 chronic freshwater criterion(ug/L) 3.0</p>	<p>Criteria consistent with EPA’s recommendations published in Ambient Aquatic Life Water Quality Criteria for Acrolein (EPA-822-R-09-010, June 2009) which is incorporated by reference in the <i>National Recommended Water Quality Criteria: 2013</i> (EPA Web Publication) as amended:</p>
7 DE Admin. Code 7401: 4.0 Criteria To Protect Designated Uses. 4.5.9.3.1 Aquatic Life Criteria: TABLE 1 WATER QUALITY CRITERIA FOR PROTECTION OF AQUATIC LIFE	<p>Carbaryl: CAS #63252 added acute freshwater criterion (ug/L) 2.1 acute freshwater criterion (ug/L) 2.1 acute marine criterion (ug/L) 1.6</p>	<p>Criteria consistent with EPA’s recommendations published in Ambient Aquatic Life Water Quality Criteria for Carbaryl(EPA-820-R-12-007, April 2012) which is incorporated by reference in the <i>National Recommended Water Quality Criteria: 2013</i> (EPA Web Publication) as amended.</p>

Section Approved	Description of Revision	EPA Rationale
7 DE Admin. Code 7401: 4.0 Criteria To Protect Designated Uses. 4.5.9.3.1 Aquatic Life Criteria: TABLE 1 WATER QUALITY CRITERIA FOR PROTECTION OF AQUATIC LIFE	Copper: CAS #7440508 revised acute freshwater criterion (ug/L) Freshwater criteria calculated using the EPA Biotic Ligand Model chronic freshwater criterion (ug/L) Freshwater criteria calculated using the EPA Biotic Ligand Model	Criteria consistent with EPA's Recommendation published in Aquatic Life Ambient Freshwater Quality Criteria-Copper 2007 Revision (EPA-822-R-07-001, February 2007) which is incorporated by reference published in the <i>National Recommended Water Quality Criteria: 2013</i> (EPA Web Publication) as amended.
7 DE Admin. Code 7401: 4.0 Criteria To Protect Designated Uses. 4.5.9.3.1 Aquatic Life Criteria: TABLE 1 WATER QUALITY CRITERIA FOR PROTECTION OF AQUATIC LIFE	Diazinon: CAS #333415 added acute freshwater criterion (ug/L) 0.17 chronic freshwater criterion (ug/L) 0.17 acute marine criterion (ug/L) 0.82 chronic marine criterion (ug/L) 0.82	Criteria consistent with EPA's recommendations published in Ambient Aquatic Life Water Quality Criteria for Diazinon (EPA-822-R-05-006, December 2005) which is incorporated by reference in the <i>National Recommended Water Quality Criteria: 2013</i> (EPA Web Publication) as amended.
7 DE Admin. Code 7401: 4.0 Criteria To Protect Designated Uses. 4.5.9.3.1 Aquatic Life Criteria: TABLE 1 WATER QUALITY CRITERIA FOR PROTECTION OF AQUATIC LIFE	Tributyltin (TBT): CAS# N.A. added acute freshwater criterion (ug/L) 0.46 chronic freshwater criterion (ug/L) 0.072 acute marine criterion (ug/L) 0.42 chronic marine criterion (ug/L) 0.0074	Criteria consistent with EPA's recommendations published in Ambient Aquatic Life Water Quality Criteria for Tributyltin (TBT)(EPA-822-R-03-031, December 2003) which is incorporated by reference published in the <i>National Recommended Water Quality Criteria: 2013</i> (EPA Web Publication) as amended.

## **Appendix B – Federally Listed Endangered and Threatened Species in Delaware**

**Federally Listed Endangered and Threatened Species  
DELAWARE**

E = Endangered

T = Threatened

C = Candidate

**BIRDS**

Plover, piping	<i>Charadrius melodus</i>	T	Sussex County
----------------	---------------------------	---	---------------

**FISH:**

Sturgeon, shortnose*	<i>Acipenser brevirostrum</i>	E	Delaware River and Delaware Bay
----------------------	-------------------------------	---	---------------------------------

**MAMMALS**

Squirrel, Delmarva fox	<i>Sciurus niger cinereus</i>	E**	Sussex County
Whale, finback*	<i>Balaenoptera physalus</i>	E	Oceanic
Whale, humpback*	<i>Megaptera novaeangliae</i>	E	Oceanic
Whale, right*	<i>Eubalaena spp.</i>	E	Oceanic

**REPTILES**

Turtle, bog	<i>Clemmys muhlenbergii</i>	T	New Castle County
Turtle, green*	<i>Chelonia mydas</i>	T	Oceanic; summer visitor coastal waters
Turtle, hawksbill*	<i>Eretmochelys imbricata</i>	E	Oceanic; summer visitor coastal waters
Turtle, leatherback*	<i>Dermochelys coriacea</i>	E	Oceanic; summer visitor coastal waters
Turtle, loggerhead*	<i>Caretta caretta</i>	T	Oceanic; summer resident coastal waters - rarely nests
Turtle, Atlantic ridley*	<i>Lepidochelys kempi</i>	E	Oceanic; summer resident coastal waters

**PLANTS**

Dropwort, Canby's	<i>Oxyopolis canbyi</i>	E	No recent records (1894)
Amaranth, seabeach	<i>Amaranthus pumilus</i>	T	Atlantic coastal beaches, Sussex County
Pink, swamp	<i>Helonius bullata</i>	T	Entire state
Pogonia, small-whorled	<i>Isotria medeoloides</i>	T	New Castle County
Beackrush, Knieskerns	<i>Rhynchospora knieskernii</i>	T	No recent records (1875)
Asphodel, bog	<i>Nartheceum americanum</i>	C	Presumed extirpated
Panic grass, Hirsts'	<i>Dichantheium hirstii</i>	C	Sussex County

\* Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Oceanic and Atmospheric Administration Fisheries Service.

\*\*Experimental population designated at Assawoman Wildlife Management Area (Federal Register Vol. 49, No. 179 pgs. 35951-35955)

## **Appendix C – Endangered and Threatened Marine Species**



## Endangered and Threatened Marine Species

(E = "endangered"; T = "threatened"; F = "foreign"; XN = "nonessential experimental population"; n/a = not applicable\*)

\* **NOTE:** Critical habitat and recovery plans are not required for foreign species; critical habitat is also not required for species listed prior to the 1978 ESA amendments that added critical habitat provisions. Bowhead whales are also exempt from recovery planning.

### Marine Mammals (28 listed "species")

*Manatees and sea otters are also listed under the ESA, but fall under the jurisdiction of the U.S. Fish and Wildlife Service.*

Species	Year Listed	Status	Critical Habitat*	Recovery Plan*
<b>Cetaceans</b>				
<b>dolphin, Chinese River / baiji</b> ( <i>Lipotes vexillifer</i> )	1989	E (F)	n/a	n/a
<b>dolphin, Indus River</b> ( <i>Platanista minor</i> )	1991	E (F)	n/a	n/a
<b>porpoise, Gulf of California harbor / vaquita</b> ( <i>Phocoena sinus</i> )	1985	E (F)	n/a	n/a
<b>whale, beluga</b> (1 listed DPS) ( <i>Delphinapterus leucas</i> )				
○ Cook Inlet	2008	E	<b>final</b>	in process
<b>whale, blue</b> ( <i>Balaenoptera musculus</i> )	1970	E	n/a	<b>final</b>
<b>whale, bowhead</b> ( <i>Balaena mysticetus</i> )	1970	E	n/a	n/a
<b>whale, false killer</b> (1 listed DPS) ( <i>Pseudorca crassidens</i> )				
○ Main Hawaiian Islands Insular	2012	E	no	no
<b>whale, fin</b> ( <i>Balaenoptera physalus</i> )	1970	E	n/a	<b>final</b>
<b>whale, gray</b> (1 listed DPS) ( <i>Eschrichtius robustus</i> )				
○ Western North Pacific	1970	E (F)	n/a	n/a
<b>whale, humpback</b> ( <i>Megaptera novaeangliae</i> )	1970	E	n/a	<b>final</b>
<b>whale, killer</b> (1 listed DPS) ( <i>Orcinus orca</i> )				

○ Southern Resident	2005	E	final	final
<b>whale, North Atlantic right</b> ( <i>Eubalaena glacialis</i> )	2008	E	final	final
original listing as "northern right whale" -	1970	E		
<b>whale, North Pacific</b> ( <i>Eubalaena japonica</i> )	2008	E	final	no
original listing as "northern right whale" -	1970	E		
<b>whale, sei</b> ( <i>Balaenoptera borealis</i> )	1970	E	n/a	final
<b>whale, Southern right whale</b> ( <i>Eubalaena australis</i> )	1970	E (F)	n/a	n/a
<b>whale, sperm</b> ( <i>Physeter macrocephalus</i> )	1970	E	n/a	final
<b>Pinnipeds</b>				
<b>sea lion, Steller</b> (1 listed DPS) ( <i>Eumetopias jubatus</i> )				
○ Western	1997	E	final	final
original listing -	1990	T		
<b>seal, bearded</b> (2 listed DPSs) ( <i>Erignathus barbatus</i> )				
○ Beringia	2012	T	no	no
○ Okhotsk	2012	T (F)	no	no
<b>seal, Guadalupe fur</b> ( <i>Arctocephalus townsendi</i> )	1985	T (F)	n/a	n/a
<b>seal, Hawaiian monk</b> ( <i>Monachus schauinslandi</i> )	1976	E	final	final
<b>seal, ringed</b> (4 listed subspecies) ( <i>Phoca hispida</i> )				



○ Okhotsk ( <i>Phoca hispida ochotensis</i> )	2012	T (F)	no	no
○ Ladoga ( <i>Phoca hispida ladogensis</i> )	2012	E (F)	no	no
<b>seal, Mediterranean monk</b> ( <i>Monachus monachus</i> )	1970	E (F)	n/a	n/a
<b>seal, Saimaa</b> ( <i>Phoca hispida saimensis</i> )	1993	E (F)	n/a	n/a
<b>seal, spotted</b> (1 listed DPS) ( <i>Phoca largha</i> )				
○ Southern	2010	T (F)	n/a	n/a

### Marine Turtles (16 listed "species")

Recovery plans for marine turtles are developed and implemented by NMFS and USFWS; the plans have been written separately for turtles in the Atlantic and Pacific oceans (and East Pacific for the green turtle) rather than for each listed species.

Species	Year Listed	Status	Critical Habitat*	Recovery Plan*
<b>green turtle</b> (2 listed populations**) (Chelonia mydas)				
○ Florida & Mexico's Pacific coast breeding colonies	1978	E	<b>final</b>	<b>final</b>
○ all other areas » <b>Hawaii population under review for delisting</b>	1978	T	<b>final</b>	<b>final</b>
<b>hawksbill turtle</b> ( <i>Eretmochelys imbricata</i> )	1970	E	<b>final</b>	<b>final</b>
<b>Kemp's ridley turtle</b> ( <i>Lepidochelys kempi</i> )	1970	E	n/a	<b>final</b>
<b>leatherback turtle</b> ( <i>Dermochelys coriacea</i> )	1970	E	<b>final</b>	<b>final</b>
<b>loggerhead turtle</b> (9 listed DPSs) ( <i>Caretta caretta</i> ) original listing – 1978			no	<b>final</b>
○ Mediterranean Sea	2011	E (F)	n/a	n/a
○ North Indian Ocean	2011	E (F)	n/a	n/a

○ North Pacific Ocean	2011	E	no	final
○ Northeast Atlantic Ocean	2011	E (F)	n/a	n/a
○ Northwest Atlantic Ocean	2011	T	no	final
○ South Atlantic Ocean	2011	T (F)	n/a	n/a
○ South Pacific Ocean	2011	E (F)	n/a	n/a
○ Southeast Indo-Pacific Ocean	2011	T (F)	n/a	n/a
○ Southwest Indian Ocean	2011	T (F)	n/a	n/a
<b>olive ridley turtle</b> (2 listed populations**) ( <i>Lepidochelys olivacea</i> )				
○ Mexico's Pacific coast breeding colonies	1978	E	n/a	final
○ all other areas	1978	T	n/a	final

\*\* These populations were listed before the 1978 ESA amendments that restricted population listings to "distinct population segments of vertebrate species."

### Marine and Anadromous Fish (44 listed "species")

Species	Year Listed	Status	Critical Habitat*	Recovery Plan*
<b>bocaccio</b> (1 listed DPS) ( <i>Sebastes paucispinis</i> )				
○ Puget Sound/ Georgia Basin	2010	E	no	no
<b>eulachon, Pacific / smelt</b> (1 listed DPS) ( <i>Thaleichthys pacificus</i> )				
○ Southern DPS	2010	T	final	no
<b>rockfish, canary</b> (1 listed DPS) ( <i>Sebastes pinniger</i> )				
○ Puget Sound/ Georgia Basin	2010	T	no	no

<u>rockfish, yelloweye</u> (1 listed DPS) ( <i>Sebastes ruberrimus</i> )				
○ Puget Sound/ Georgia Basin	2010	T	no	no
<u>salmon, Atlantic</u> (1 listed DPS) ( <i>Salmo salar</i> )				
○ Gulf of Maine  original listing -	2009* *expanded  2000	E	<u>final</u>	<u>final</u>
<u>salmon, Chinook</u> (9 listed ESUs & 1 XN) ( <i>Oncorhynchus tshawytscha</i> )				
○ California coastal	1999**	T	<u>final</u>	<u>in process</u>
○ Central Valley spring-run	1999**	T	<u>final</u>	<u>draft</u>
○ Central Valley spring-run in the San Joaquin River, CA	2013	XN	n/a	-
○ Lower Columbia River	1999**	T	<u>final</u>	<u>in process</u>
○ Upper Columbia River spring-run	1999**	E	<u>final</u>	<u>final</u>
○ Puget Sound	1999**	T	<u>final</u>	<u>final</u>
○ Sacramento River winter-run	1994**	E	<u>final</u>	<u>draft</u>
○ Snake River fall-run	1992**	T	<u>final</u>	<u>in process</u>
○ Snake River spring/ summer-run	1992**	T	<u>final</u>	<u>in process</u>
○ Upper Willamette River	1999**	T	<u>final</u>	<u>in process</u>
<u>salmon, chum</u> (2 listed ESUs) ( <i>Oncorhynchus keta</i> )				
○ Columbia River	1999**	T	<u>final</u>	<u>in process</u>
○ Hood Canal summer-run	1999**	T	<u>final</u>	<u>final</u>

<u>salmon. coho</u> (4 listed ESUs) ( <i>Oncorhynchus kisutch</i> )				
○ Central California coast <i>original listing -</i>	2005** 1996**	E T	<u>final</u>	<u>in process</u>
○ Lower Columbia River	2005**	T	not yet proposed	<u>in process</u>
○ Oregon coast	2008	T	<u>final</u>	no
○ Southern Oregon & Northern California coasts	1997**	T	<u>final</u>	<u>in process</u>
<u>salmon. sockeye</u> (2 listed ESUs) ( <i>Oncorhynchus nerka</i> )				
○ Ozette Lake	1999**	T	<u>final</u>	<u>final</u>
○ Snake River	1991**	E	<u>final</u>	<u>in process</u>
<u>sawfish. largetooth</u> ( <i>Pristis perotteti</i> )	2011	E	no	no
<u>sawfish. smalltooth</u> (1 listed DPS) ( <i>Pristis pectinata</i> )				
○ U.S. portion of range	2003	E	<u>final</u>	<u>final</u>
<u>sturgeon. Atlantic</u> (5 DPSs) ( <i>Acipenser oxyrinchus oxyrinchus</i> )				
○ Gulf of Maine	2012	T	no	no
○ New York Bight	2012	E	no	no
○ Chesapeake Bay	2012	E	no	no
○ Carolina	2012	E	no	no
○ South Atlantic	2012	E	no	no
<u>sturgeon. green</u> (1 listed DPS) ( <i>Acipenser medirostris</i> )				

○ Southern DPS	2006	T	<a href="#">final</a>	in process
<a href="#">sturgeon, Gulf</a> ( <i>Acipenser oxyrinchus desotoi</i> )	1991	T	<a href="#">final</a>	<a href="#">final</a>
<a href="#">sturgeon, shortnose</a> ( <i>Acipenser brevirostrum</i> )	1967	E	n/a	<a href="#">final</a>
<a href="#">totoaba</a> ( <i>Totoaba macdonaldi</i> )	1979	E (F)	n/a	n/a
<a href="#">trout, steelhead</a> (11 listed DPSs & 1 XN) ( <i>Oncorhynchus mykiss</i> )				
○ Puget Sound	2007	T	in process	no
○ Central California coast	1997**	T	<a href="#">final</a>	<a href="#">in process</a>
○ Snake River Basin	1997**	T	<a href="#">final</a>	<a href="#">in process</a>
○ Upper Columbia River  original listing - change in status - court reinstated status -	2009***  1997** 2006** 2007***	T  E T E	<a href="#">final</a>	<a href="#">final</a>
*** reinstated to endangered status per U.S. District Court decision in June 2007; <a href="#">reclassified to threatened</a> [pdf] per U.S. District Court order in June 2009				
○ Southern California	1997**	E	<a href="#">final</a>	<a href="#">draft</a>
○ Middle Columbia River	1999**	T	<a href="#">final</a>	<a href="#">final</a>
○ Middle Columbia River	2013	XN	n/a	
○ Lower Columbia River	1998**	T	<a href="#">final</a>	<a href="#">in process</a>
○ Upper Willamette River	1999**	T	<a href="#">final</a>	<a href="#">in process</a>
○ Northern California	2000**	T	<a href="#">final</a>	<a href="#">in process</a>
○ South-Central California coast	1997**	T	<a href="#">final</a>	<a href="#">in process</a>
○ California Central Valley	1998**	T	<a href="#">final</a>	<a href="#">draft</a>



\*\* All Pacific salmonid listings were revisited in 2005 and 2006. Only the salmonids whose status changed as a result of the review will show the revised date; for all others, only the original listing date is shown. For more information on the listing history, please click on the link for each ESU/DPS.

### Marine Invertebrates (4 listed Species)

Species	Year Listed	Status	Critical Habitat*	Recovery Plan*
<a href="#"><u>abalone, black</u></a> ( <i>Haliotis cracherodii</i> )	2009	E	<a href="#"><u>final</u></a>	No
<a href="#"><u>abalone, white</u></a> ( <i>Haliotis sorenseni</i> )	2001	E	<a href="#"><u>not prudent</u></a> [pdf]	<a href="#"><u>final</u></a>
<a href="#"><u>coral, elkhorn</u></a> ** ( <i>Acropora palmata</i> )	2006	T**	<a href="#"><u>final</u></a>	in process
<a href="#"><u>coral, staghorn</u></a> ** ( <i>Acropora cervicornis</i> )	2006	T**	<a href="#"><u>final</u></a>	in process

\*\* These corals are [proposed to be reclassified from threatened to endangered](#).

### Marine Plants (1 listed "[species](#)")

Species	Year Listed	Status	Critical Habitat*	Recovery Plan*
<a href="#"><u>Johnson's seagrass</u></a> ( <i>Halophila johnsonii</i> )	1999	T	<a href="#"><u>final</u></a>	<a href="#"><u>final</u></a>

Updated: January 29, 2014